

REMARKS

The Applicant has amended Claims 49-54. Claims 49-54 have not been amended in view of any cited art or rejection or for any other reason of patentability. Rather, the Claims 49-54 have been amended to add further clarity. Accordingly, Claims 49-54 are pending for examination, with Claims 49 and 53 being independent claims.

Claim Objections

Claims 53 and 54 were objected to due to a lack of antecedent basis for the term "database" in the collecting step of claim 53. Claim 53 has been amended to provide proper antecedent basis for the term "database." As such, it is requested that the objection to Claims 53 and 54 be reconsidered and withdrawn. This amendment of claim 53 is not believed to narrow the scope of Claims 53 or 54 in any way.

Rejections under 35 U.S.C. § 101

Claims 49-54 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. In particular, the Office states:

For a claimed invention to be statutory, the claimed invention must be within the technological arts. . . . For a claim to pass muster, the recorded steps must somehow apply, involve, use, or advance the technological arts such as a computer and generate a tangible result. In the present case, claims 49 and 53 only recite an abstract idea. The recited steps of approximating an answer by using tuples do not apply, involve, use, or advance the technological arts since all of the recited steps can be

performed in the mind of the user or by use of pencil and paper.

The Applicant respectfully disagrees with the rejection for at least the following reasons. First, the Applicant would like to point out that the preambles of claims 49 – 52 explicitly recite that the methods defined therein are “computer-implemented.” As such, and by definition, the steps of these claims are performed by a computer, not the human mind. Second, each of claims 53 and 54 are directed to computer-readable media storing functional computer-executable instructions. As stated in the Manual of Patent Examining Procedure (MPEP), “[A] claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory.”

Further, with respect to the “technological arts” rejection of claims 49 –54, the Board of Patent Appeals and Interferences (BPAI) has determined that there is no judicially recognized separate “technological arts test” to determine patent eligible subject matter under 35 U.S.C. § 101. In *Ex parte Lundgren*, Appeal No. 2003–2088, Application 08/093,516, (Precedential BPAI opinion September 2005), the BPAI rejected the Examiner’s argument that *Musgrave* and *Toma* created a technological arts test. “We do not believe the court could have been any clearer in rejecting the theory the present examiner now advances in this case.” *Lundgren*, at 8. The BPAI held that “there is currently no judicially recognized separate “technological arts” test to determine patent eligible subject matter under § 101.” *Lundgren* at 9. Therefore, as no “technological arts test” is available, any rejection under 35 U.S.C. § 101 on grounds that the claimed subject matter does not apply, involve, use, or advance the technological arts is inappropriate.

Accordingly, the subject matter of Claims 49–54 is believed to be patentable subject matter under § 101. The Applicant respectfully requests the rejections to Claim 49–54 under 35 U.S.C. § 101 be withdrawn.

Rejections under 35 U.S.C. § 112

Claims 49–53 stand rejected under 35 U.S.C. § 112 as being indefinite for failing to point out and distinctly claim the subject matter which the Applicant regards as the invention. Specifically, the Office first states that the term “tuple” is indefinite with regard to Claims 49 and 53. The Office states that it is not clear what the metes and bounds of a tuple are and it is further not clear how tuples are managed. The Applicant respectfully traverses the rejection as follows.

M.P.E.P. § 706.03(d) ¶7.34.01 states that “if the scope of the claimed subject matter can be determined by one having ordinary skill in the art, a rejection using this form paragraph would not be appropriate.” The term “tuple” is known to one of ordinary skill in the art as being analogous to a “record” in a database. Furthermore, tuples are definitively demonstrated with regard to Figure 4 in the Specification of Application. See, Specification of the Application, page 15, lines 5–8:

A simple example of selecting the outlier values and finding the estimated aggregate is described with respect to Figure 4. Twelve values are shown, corresponding to twelve tuples in a database. The values are shown four times, in columns 420, 425, 430 and 435.

With regard to the management of tuples, as can be seen by the above section of the Specification of the Application, the tuples are arranged in a set of top-to-bottom lists corresponding to columns. Tuples are also arranged in a tabular structure in Figure 4. The management of information in lists and tables may be performed in various ways as those skilled in the art would appreciate and understand.

The Office further asserts that “sample tuples” as recited are indefinite. The Applicant respectfully disagrees with the assertion as the Specification of the Application is very clear regarding the use of sample tuples. Regardless, to further prosecution Claims 49 and 53 have been amended such that sample tuples are not longer recited. However, this amendment to Claims 49 and 53 has been made for reasons of clarity and not in view of any cited art or rejection. Further, this amendment to Claims 49 and 53 does not narrow the scope of the claims in any way.

The Office further asserts that the feature of “approximating an answer” is indefinite as approximating is not distinct and does not generate the same result every time. The Applicant respectfully disagrees with this assertion. The Office does not offer any proof to support the assertion that an “approximating an answer” cannot generate the same result every time. In contrast, if the method of approximating is consistently applied the same result can be repeated. For example, a method of approximating the addition of two floating point numbers may performed by rounding the decimal portion of the number to the nearest whole number. That is, in approximating the answer to the equation $1.5 + 1.6$, an approximate answer of 4 may be generated by rounding 1.5 to 2 and 1.6 to 2. The operation may be repeated and generate the same result every time. Regardless, Claims 49 and 53 have been amended such that the feature of approximating an answer is no longer recited. The amendments to Claims 49 and 53 have been made to progress prosecution and not in view of any cited prior art or because of any rejection.

The Office then goes on to assert with regard to Claim 53 that the preamble “one or more” is indefinite in that it is not clear what computer readable media if more than one implements what portion of the method. The applicant respectfully disagrees with this assertion. The claim does not recite one or more computer readable media implementing parts of the claimed subject matter; in contrast, one or more computer-

readable media may implement the whole method. Regardless, Claim 53 has been amended such that Claim 53 now recites “a computer-readable media”. The amendment to Claim 53 was made to move prosecution forward and was not made in view of any cited prior art or because of any rejection and does not limit the scope of the claimed subject matter in any way.

Finally, the Office asserts that “the sample” of Claim 53 is indefinite in that it is not clear whether a sample of weights or tuples is used in the executing step. Claim 53 has been amended to replace “sample of tuples” with “subset of tuples”. As such, the indefiniteness rejection of claim 53 is now moot. This amendment to Claim 53 has been made for reasons of clarity and not in view of any cited art or rejection. Further, this amendment to Claim 53 and does not narrow the scope of Claim 52 in any way.

Accordingly, the Applicant respectfully requests the rejection to Claims 49 and 53 under 35 U.S.C. § 112, second paragraph, be reconsidered and withdrawn. Claims 50–52 and Claim 54 depend from Claims 49 and 53 respectively and the Applicant further requests the rejections under 35 U.S.C. § 112, second paragraph, be reconsidered and withdrawn for at least the reasons set forth above with regard to Claims 49 and 53.

Rejections under 35 U.S.C. § 102

Claims 49–51 and 53 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,026,391 to Osborn (hereafter “Osborn”). The Applicant respectfully traverses the rejection as follows.

In general, Osborn is directed to a module for estimating the amount of time a query is expected to take based on statistics compiled from previous queries. For example, the Abstract of Osborn recites:

[I]n particular, an estimated CPU time for executing the present query is derived by extrapolating actual CPU times recorded for past queries having the closest estimated costs for accessing the same, or similar, tables or items in the database, using a form of a 'nearest neighbor' algorithm to match the present query to either identical or statistically closest past queries." In contrast, Claims 49–51 and 53 are directed to determining an answer to a query. That is, the answer to a query and the estimated CPU time a query is expected to take are two different and distinct determinations. An answer to a query results in actual data which may be further analyzed while the CPU time is singular piece of information that is useful only for understanding how long a query is expected to take. An answer to a query and the amount of time a query is expected to take may not be used interchangeably.

The Office states with respect to the rejection to Claims 49–51 and 53 that "determining sample weight based on the access frequency of the tuples" is disclosed at col. 7, lines 17–23 of Osborn, noting "statistics cache 48 includes number of times particular table and columns were accessed." The Office further asserts that "selecting a sample of tuples from the database based on weights of the tuples" is also disclosed at col. 7, lines 17–23 of Osborn, noting "result sets of past queries". Col. 7, lines 17–23 of Osborn reads as follows:

If no exact match is found, a nearest neighbor algorithm **83** is employed to extrapolate an estimated CPU time **84** based on a weighted average of CPU times for the closest matching stored queries – i.e., from the "nearest

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neighbors” of the present query 40 based on the respective recorded estimate costs and result sets of the past queries.

The Applicant respectfully disagrees with the Office’s assertions. The current amendment to claim 53 has removed the element of “access frequency” with “a number of times each tuple in a set of tuples in the database was accessed”. Furthermore, the cited section of Osborn fails to disclose determining a weight based on the number of times each tuple in a set of tuples in the database was accessed. Rather, the cited section of Osborn discloses a weighted average of CPU times. A weighted average of CPU times is not equivalent to a weight based on the number of times each tuple in a set of tuples in the database was accessed. More particularly, the cited section of Osborn is silent with regard to determining a weight based on the number of times an individual tuple was access during past queries. More particularly, such a tuple access frequency is disclosed in the Specification of the Application, page 19, lines 32, to page 20, line 1, as follows:

The execution of the workload reveals additional information on usage of specific tuples, e.g., frequency of access to each tuple, the number of queries in the workload for which it passes the selection condition of the query.

In contrast, the cited section of Osborn simply attempts to correlate queries by examining the result sets and comparing the result sets. That is, the cited section of Osborn is silent with regard to the number of times an individual tuple passed the selection condition of a query. And, the silence of Osborn with regard to the number of times an individual tuple passed the selection condition of a query is to be expected as the cited section of Osborn only correlates queries by comparing the results of the query. That is, the cited section of Osborn is only concerned with whether a tuple was

part of the result set of a query and not the number of times the tuple passed the selection condition of the query.

Because the cited section of Osborn does not disclose determining a weight based on the number of times each tuple was accessed in past queries, it follows that Osborn is not capable of disclosing an operation to select tuples based on the weights of the tuples. In particular, the cited section of Osborn does not disclose any sort of selecting operation; rather, the only operation disclosed in the cited section of Osborn is an operation to extrapolate an estimated CPU time.

The Office further asserts that “executing a query against the sample to determine an approximate answer to the query made against the database” is disclosed at Fig. 4, item 80 of Osborn, “compare result set with past queries”. The Applicant notes that Claim 53 has been amended as follows: “executing a query against the subset of tuples to determine an answer to the query made against the database”. Further, the Applicant respectfully disagrees with the rejection.

Item 80 of Figure 4 of Osborn is disclosed at col. 7, lines 7–16 as follows:

Referring additionally to FIG. 4, the QPP module 46 compares 80 the cost estimate 44 and result set 45 for the present query 40 to the recorded estimated costs and result sets of past queries stored in the query statistics cache 48. If an exact match is found between the present query 40 and a recorded past query 58 stored in the cache 48 (i.e., wherein both queries have the same estimated costs for the same result sets), the QPP module 46 selects the recorded actual CPU time 72 of the matching past query 58 as an estimated CPU time 82 for the present query 40.

The result of the operation disclosed at item 80 of FIG. 4 of Osborn is the estimated CPU time for the query. The estimated CPU time for a query is not an answer

to the query made against the database. That is, the estimated CPU time cannot be used interchangeable with an answer to a query made against a database.

Accordingly, Claims 49 and 53 are patentably distinct over Osborn for at least the reasons discussed above. Claims 50–52 depend from Claim 49 and are patentably distinct for at least the same reasons.

Rejections under 35 U.S.C. § 103

Claims 52 and 54 were rejected under 35 U.S.C. § 103(a) as being anticipated by U.S. Patent No. 6,026,391 to Osborn (hereafter “Osborn”) in view of U.S. Patent No. 6,519,604 to Acharya et. al (hereafter “Acharya”). The Applicant respectfully traverses the rejection as follows.

Claims 52 and 54 depend from claim 49 and 53 respectively and are allowable for at least the same reasons as discussed above.

CONCLUSION

Accordingly, in view of the above amendment and remarks it is submitted that the claims are patentably distinct over the prior art and that all the rejections to the claims have been overcome. Reconsideration and reexamination of the above Application is requested. Based on the foregoing, the Applicant respectfully requests that the pending claims be allowed, and that a timely Notice of Allowance be issued in this case. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, the Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee that is not covered by an enclosed check please charge any deficiency to Deposit Account No. 50-0463.

Respectfully submitted,
Microsoft Corporation

Date: June 15, 2006
Microsoft Corporation
One Microsoft Way
Redmond WA 98052-6399

By: Steven J. Spellman
Steven J. Spellman, Reg. No.: 45,124
Attorney for Applicant
Direct telephone (425) 707-9382

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Noemi Tovar
Signature
Noemi Tovar
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